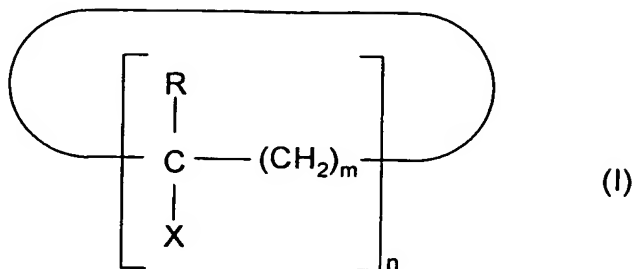


We claim:

1. A substituted cycloalkane comprising a 7- to 12-membered carbocyclic ring of the formula I

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where

R is C₁-C₆-alkyl,

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X is halogen, OR¹ or OCOR¹, where R¹ is C₁-C₆-alkyl,

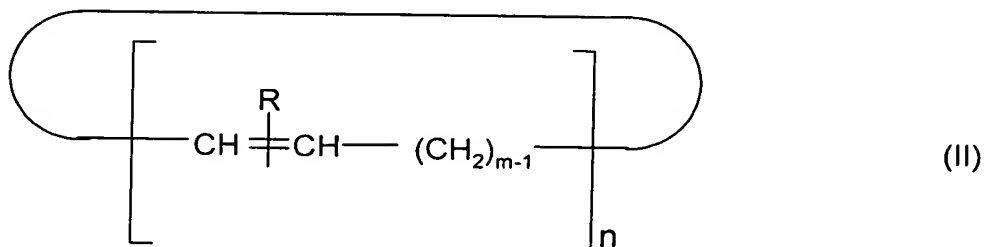
n is 2 or 3 and

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m is an integer of at least 1.

2. A compound as claimed in claim 1 in which R is methyl.
3. A compound as claimed in claim 1 or 2 in which X is chlorine.
4. A compound as claimed in claim 1 selected from among 1,4-dichloro-1,4-dimethylcyclooctane, 1,5-dichloro-1,5-dimethylcyclooctane and mixtures thereof.
5. A process for preparing a substituted cycloalkane of the formula I as claimed in claim 1, which comprises reacting a cycloalkapolyene of the formula II

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with a compound HX at below 40°C, where the symbols R, X, m and n are as defined in claim 1.

6. A process as claimed in claim 5, wherein the compound HX used is gaseous hydrogen chloride.
- 5 7. A process as claimed in claim 5 or 6, wherein the cycloalkapolyene of the formula II used is 1,5-dimethylcycloocta-1,5-diene and/or 1,6-dimethylcycloocta-1,5-diene.
- 10 8. A process as claimed in any of claims 5 to 7, wherein the reaction is carried out in the absence of a solvent or in the presence of an aprotic solvent.
9. A cationic polymerization process which comprises polymerizing cationically polymerizable ethylenically unsaturated monomers in the presence of a substituted cycloalkane of the formula I as claimed in claim 1 and a Lewis acid.
- 15 10. A process as claimed in claim 9, wherein the compound of the formula I is 1,5-dichloro-1,5-dimethylcyclooctane and/or 1,4-dichloro-1,4-dimethylcyclooctane.
11. A process as claimed in claim 9 or 10, wherein the cationically polymerizable ethylenically unsaturated monomers include isobutene.